

REMARKS

Claims 2-7, 9, 11-15, 17-23, 25-28, 31-34, 37-51 and 53-73 have been rejected by the Examiner under 35 USC 103(a) as being unpatentable over Luciani et al., EP 0480483 (Luciani I). Claims 2-7, 9, 11-15, 17-23, 25-28, 31-34, 37-51 and 53-73 have been rejected by the Examiner under 35 USC 103(a) as being unpatentable over Luciani et al. EP 0522651 Luciani II).

Claims 2-7, 9, 11-15, 17-23, 25-28, 31-34, 37-51 and 53-73 have been rejected by the Examiner under 35 USC 103(a) as being unpatentable over WO 91108239 (Neste). These rejections are respectfully traversed.

The present invention defines a unique catalyst composition which contains specific amounts of catalytically active components, that is, specific amounts of Ti, Mg and Cl, which when used in a polymerization process produces homopolymers and/or copolymers of either high density polyethylene (HDPE) or Linear Low Density Polyethylene (LLDPE) with a controlled morphology, having one or more of the following properties, that is, high bulk density, a very small quantity of fines in the product, good co-monomer insertion, improved catalytic activity with low catalytic decay, and a substantial homogenous distribution of the alpha-olefin within the polymer chain in connection with LLDPE.

The main focus of the present invention, as discussed at the interview with the Examiner and his Supervisory Examiner, is the specific catalyst, a process for producing such a catalyst, as well as a process for the polymerization or copolymerization of a polyolefin such as polyethylene, using such a solid catalyst. The composition of the catalyst of the present invention which contains Ti, Mg, Cl alkoxy groups and organo metallic compounds and the use of non-polar organic solvents to impregnate the particular silica, defines a catalyst system having a different behavior which, in turn, produces a different final product in the polyolefin

polymerization and copolymerization process. That is, because the present invention utilizes a specific amount of titanium, a specific amount of magnesium and a specific amount of chlorine, which remains fixed on the solid catalyst component and because of the use of inert organic solvents (non-polar solvents), it is possible to produce particles of homo and copolymers of olefins, for example, ethylene, with controlled morphology, having a high bulk density and containing a very small quantity of fines. The catalyst system of the present invention is also effective in achieving good co-monomer insertion into the final product as well as improved catalytic activity and low catalytic decay.

Catalyst systems currently being used in polymerization processes are based on the use of a magnesium dichloride support with titanium sites deposited on the support which is a very high activity catalyst in LLDPE copolymerization. As known in the state of the art, this kind of support produces a catalyst with a high degree multiplicity of titanium sites and because of this fact, the comonomer response LLDPE copolymerization is heterogeneous. This heterogeneous behavior is due to the fact that the titanium sites have a different steric and an electronic neighborhood. This heterogeneity is reflected on the higher xylene soluble fraction which is generated when the LLDPE is produced. With the intention of getting more homogeneity of the titanium sites and, consequently, better comonomer response, Luciani I and Luciani II added a compound to the process known as a donor or electron donor compound. This donor was added in the catalyst synthesis or during the polymerization and acts as a selective poison for some of the titanium sites. The way it acts is based on Lewis Theory (G.N. Lewis, 1923), which says that in acid-base reactions "bases donate pairs of electrons and acids accept pairs of electrons". In Luciani I and Luciani II, an aromatic or aliphatic ester is used for a solution preparation of magnesium and titanium compounds. In this case both magnesium and titanium compounds used in the solution preparation act as Lewis acids and the ester, which has oxygen groups, acts as a Lewis base. When this solution is deposited over an inert support, part of this donor remains bonded to the titanium or magnesium sites. This kind of selectivity poisoning of titanium or magnesium sites affects the behavior thereof during copolymerization generating more homogeneous sites. This higher homogeneity of the sites, consequently, affects the xylene soluble fraction content which becomes smaller during the copolymerization. Examples of Lewis

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acids are titanium and magnesium compounds and of Lewis bases are compounds with oxygen, nitrogen groups (water, ester, ether, amines, etc.) which have extra electrons to donate.

As can be seen by referring to the present application, no electron donor or donor is used, as detailed in the Summary of the Invention, in the Detailed Description and in the Claims. In the present invention, the homogeneity of the sites of the solid catalyst component is reached through the amounts of components present in the solid catalyst and in the fact that no donor or electron donor is used during the solid catalyst component preparation.

One of the unexpected results obtained from the present application, when compared to the cited prior art references (EP 0522651A, EP 0480435A and WO 91/08239), is the crystalline structure deposited over the support of the catalytic composition, which directly affects the behavior of the active sites during the olefin polymerization.

In an attempt to demonstrate to the Examiner the non obviousness of the present invention, one of the "tools" used was the reproduction of some examples shown in the cited references which enables a better understanding of each invention. In this way, it is possible to demonstrate the inventiveness of the present invention, when applied in polymerization processes, because the polymers produced according to the examples show inferior properties when compared to the properties of polymers obtained in accordance with the present invention.

Some of the major benefits obtained by the present invention are as follows:

- 1- The ability to produce a copolymer with a low amount of xylene soluble (XS) (<10%) using the catalytic composition of the present invention. Please see claim 62 of the present application.
- 2- The ability to achieve the catalytic composition of the present invention with a simplified preparation process.
- 3- The ability to achieve a catalytic composition with low levels of Ti and Mg. Please see claims 58 and 65 of the present application.
- 4- Obtaining polymers with a high bulk density. Please see claims 62 and 70 of the present application.

In order to understand why a copolymer according to the present application shows low amount of XS when compared to the polymers produced in accordance with examples from the three prior art references, it is important to carefully consider the following:

Upon examining references **EP 0522651A** and **EP 0480435A**, step (ii) from the process to prepare the solid component catalyst from the first reference (EP 0522651A) shows the impregnation of the support with a solution made from a mixture of magnesium chloride (MgCl_2), titanium compounds (TiCl_4 and Ti(OR)_4) and a liquid aliphatic or aromatic ester, which has the ability to solubilize both magnesium and titanium compounds. In the same way, in step (1) of the process of catalyst preparation of the second reference (EP 0480435A), a solution of MgCl_2 , a titanium compound (Ti(OR)_4) and an aliphatic ester, which has the ability to solubilize both magnesium and titanium compounds, is produced. Thus, in both references, the ester, which has COO as a functional group, acts as an electron donor compound.

It is well known in organometallic chemistry that, when an electron donor compound is used, such as for example, *n*-butanol or methyl acetate, the MgCl_2 crystal is destroyed, as observed by Kashiwa and co-workers [ref 1]. This happens because the MgCl_2 crystal shows (100) and (110) lateral cuts in the structure wherein there are coordinatively unsaturated Mg^{2+} ions with coordination numbers 4 and 5, respectively. [refs 2,3] (see Figure 1). The presence of the electron donor will make it more strongly bonded to the (110) lateral cut, since this is the most acid one (Lewis acid) and this association will form organometallic compounds known as adduct [refs 4,5-11]. Metal salts such as TiCl_4 , belonging to block d of the Periodic Table, which have the tetrahedral structure, may also form adducts in the presence of electron donor compounds or solvents [ref 11].

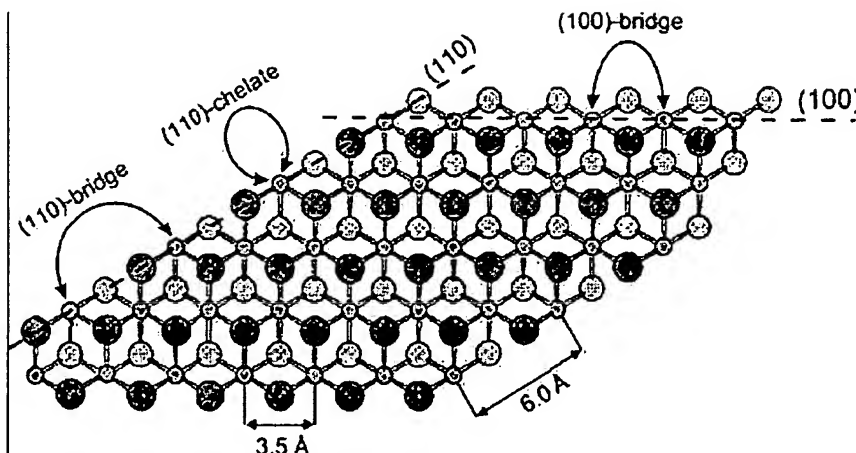


Figure 1. Schematic representation of a MgCl_2 monolayer. The Mg atoms are colored in orange. The Cl atoms above the Mg plane are dark green colored, whereas the Cl atoms below the Mg plane are light green colored. The (100) and (110) lateral cuts with 5- and 4-coordinated Mg atoms are indicated. The double arrow curves represent possible coordination modes of the donors.

The inventions disclosed in the above references (EP 0522651A and EP 0480435A) both comprise a support which is thermal activated silica. In all references, including this application, the silanol and siloxane groups which are on the surface of the silica, are reacted with organometallic compounds containing metals from groups 1, 2, 12 or 13 of the Periodic Table. In this way, the titanium active centers impregnated over the silica will not be directly linked to these oxygenated groups from silica. In other words, these oxygenated groups will not donate electrons to the titanium, as they are not linked to each other.

After the impregnation of the silica with the solution produced in these references (EP 0522651A and EP 0480435A), the polar solvent starts to be removed by reduced pressure and the catalytic product, composed of electron donor adducts with MgCl_2 , TiCl_4 and/or $\text{Ti}(\text{OR})_4$, starts to precipitate. It is important to observe that the product which precipitates over the silica, initially consisting of MgCl_2 , TiCl_4 and/or $\text{Ti}(\text{OR})_4$ adducts with the polar solvent, the latter being the electron donor, has a modified crystalline structure compared to the original salts, even if the aluminum alkyl removes all electron donor after the precipitation or deposition step. The final crystalline structure is different in terms of steric and electronic neighborhood of the

titanium atom. In the present application, no polar solvent acting as electron donor is used during the catalyst preparation. This means that there is no need to have a removal step of the solvent, by reduced pressure or any other way, making the process of the present invention simpler and less costly. In addition, in the present application, the precipitation of the catalytic product over the silica occurs in step (f) which corresponds to the reaction with the chlorinated agents and in this way there is no adduct formation.

When comparing the catalytic product precipitated over the silica in the references with the catalytic products of the present invention, the crystalline structures are different because during the removal step of the polar solvent (electron donor), the solvent influences the formation and modifies the crystalline structure deposited over the silica.

With respect to the reference **WO 91/08239**, the precipitation of the catalytic portion over the silica occurs by its reaction with chlorinated alkyl aluminum, such as ethyl-aluminum-dichloride, diethyl-aluminum-chloride or ethyl-aluminum-sesquichloride, which has reduction agent characteristics. In such a way, in this step, pre-reduction of Ti^{IV} to Ti^{III} species also occurs, and this reduced species can be presented in four different crystalline forms (α , β , γ and δ) wherein the β is the preferred one when a reaction with the alkyl takes place [ref. 12]. In the case of the present invention, the chlorination stage preferably occurs through agents, such as $SiCl_4$, which is an oxidant compound. Thus, there is no formation of Ti^{III} species in this stage, since it preferably uses an oxidizing agent such as a chlorinating compound. In the process of the present invention it is optional to have a reaction with aluminum alkyl after the chlorination stage. Thus the catalytic composition from reference **WO 91/08239** has titanium sites with different oxidation states and also a different electronic and steric neighborhood, when compared to the present invention.

Thus, it is not obvious that, when the polar solvent (electron donor) is removed, the catalyst compound which is produced is equivalent to the catalyst compound of the present invention. Thus, once a polar solvent is used in the preparation of the catalyst, it influences the crystalline structure of the active sites in the final catalyst.

Thus, the crystalline structure that is deposited on the silica of the prior art references (**EP 0522651 A**, **EP 0480435 A** and **WO 91/08239**) will not have the same behavior in ethylene

copolymerization with α -olefins when compared to the structure of the present invention, because when these monomers coordinate on the active site, they will be electronically and sterically influenced in a different way when compared to coordination with the sites of the present invention.

In order to demonstrate the effect of this difference in the steric and electronic neighborhood, new copolymerization tests, using examples of these references and of the present application, have been carried out in order to obtain LLDPE films having as their main characteristic a MFI of between 0.65 to 0.91g/10 min and a density between 0.917 to 0.919 g/cm³.

The reaction conditions used, such as the solvent, temperature, cocatalyst, Al / Ti molar ratio and the reaction time, were the same for all examples (Table 1). The main properties evaluated on the obtained polymers were the amount of xylene soluble (XS) and the viscosity of this soluble fraction. The XS extracted from the polymers represents an amorphous or oligomer product containing a high concentration of comonomer and the amount produced depends on the active site behavior (steric and electronic neighborhood). In its turn, the viscosity of this soluble fraction represents its molecular weight.

Upon comparing, on the same basis, the LLDPE having MFI ranging from 0.65 to 0.91g/10 min and density ranging from 0.917 to 0.919 g/cm³ (see Test numbers 1, 2, 4 and 5), it can be observed that the amount of XS were higher in the polymers from tests 2, 4 and 5, which represents examples from the 3 references (EP 0522651 A, EP 0480435 A and WO 91/08239). The maximum allowable quantity of XS in industrial LLDPE production, in slurry or gas phase reactions, is 10% wt because more than this amount could make the process impracticable in terms of "chunks" formation risk, which could stop the production and thus increase cost.

Moreover, the presence of the higher amount of XS in the polymer could cause the phenomenon known as "blocking," which means the migration of this fraction to the surface of films obtained from this type of resin causing the "stickiness" of the films. The blocking problem can be solved by the addition to the resin of large volumes of silicates, thus creating a rough surface. However, in this case, transparency properties of the product are affected. The present invention appropriately fulfills these requirements, providing a resin which produces a high

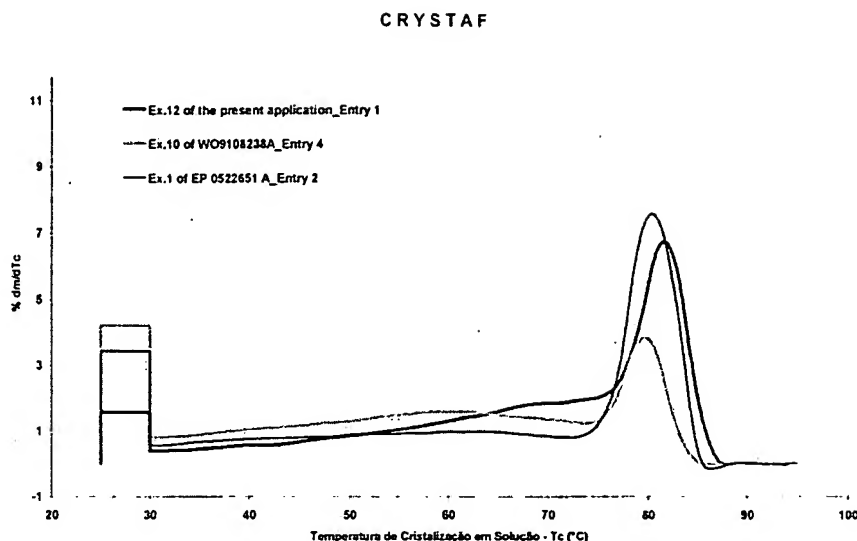
transparent film without blocking characteristics. One of the main applications of these kinds of films is the automatic packaging of grains, which represents a big volume in the Brazilian market.

Table 1

| Comparative Test Number | | 1 | 2 | 3 | 4 | 5 | 6 |
|-------------------------|---|----------------------------------|----------------------|----------------------|------------------------|----------------------|------------------------|
| Product | | LLDPE | LLDPE | LLDPE | LLDPE | LLDPE | LLDPE |
| Catalysis Data | Catalyst used | Ex.12 of the present application | Ex.1 of EP 0522651 A | Ex.4 of EP 0522651 A | Ex.10 of WO 91 08239 A | Ex.3 of EP 0480435 A | Ex.10 of WO 91 08239 A |
| | Ti (%wt) | 2.0 | 3.0 | 5.2 | 3.9 | 5.6 | 3.9 |
| | Mg (%wt) | 1.5 | 2.8 | 3.4 | 0.8 | 2.3 | 0.8 |
| | Electron donor in the catalyst preparation? | No | Yes | Yes | No | Yes | No |
| Polymerization Data | Cocatalyst | TEAL | TEAL | TEAL | TEAL | TEAL | TEAL |
| | Catalyst mass (mg) | 60 | 60 | 60 | 60 | 60 | 60 |
| | Temperature (°C) | 75 | 75 | 75 | 75 | 75 | 75 |
| | Time (h) | 3 | 3 | 3 | 3 | 3 | 3 |
| | Al/Ti | 300 | 300 | 300 | 300 | 300 | 300 |
| | Amount of butene-1 added (ml) | 290 | 1000 | 700 | 900 | 800 | 900 |
| | H ₂ /C ₂ (bar/bar) | 0.47 | 0.50 | 0.40 | 0.40 | 0.40 | 0.45 |
| Polymerization Results | Activity (KgPol/gTi) | 330 | 114 | 76 | 127 | 80 | 76 |
| | Bulk Density (g/cm ³) | 0.36 | 0.30 | 0.29 | 0.30 | 0.27 | 0.31 |
| | MFI (2.16) (g/10min) | 0.91 | 0.98 | 1.34 | 0.84 | 0.76 | 1.53 |
| | Density (g/cm ³) | 0.9170 | 0.9184 | 0.9187 | 0.9190 | 0.9189 | 0.9176 |
| Polymer Properties | Content of butene in the polymer (%wt) | 8.7 | 8.9 | 9.7 | 8.4 | 9.0 | 10.0 |
| | Xylene solubles (%wt) | 9.7 | 14.5 | 14.6 | 14.1 | 15.7 | 16.2 |
| | Intrinsic viscosity of Xylene Soluble fraction (dl/g) | 1.46 | 0.98 | N.A. | 1.00 | N.A. | 1.10 |
| | Intrinsic viscosity of Amorphous fraction (dl/g) | 1.44 | 1.29 | N.A. | 0.98 | N.A. | 1.13 |

N.A. = NOT ANALYSED

During the ethylene copolymerization with butene-1, it is known that the comonomer incorporation in LLDPE results in polymer chain irregularities which modify the ability of crystallization. The composition distribution can be measured by a technique called CRYSTAF which separates molecules according to their amount of comonomer (see ref 13). This technique is based on monitoring the crystallization of LLDPE and the concentration is measured during crystallization. This technique was also used in order to demonstrate that the catalytic systems present in the references have a different behavior when compared with the present invention (see graphic 1).



Graphic 1

Upon analyzing the above Graphic, it is observed that when the temperature begins to decrease, the polymer fractions, which crystallized faster and are composed of molecules with little or no comonomer, precipitate first, thus resulting in a decrease in the concentration of the solution. As the temperature decreases, fractions of polymers with the largest amount of comonomer precipitate. The last fractions represent those polymers which remained soluble due to the low molecular weight and the high amount of comonomer, i.e. a fraction soluble in Xylene (XS).

Thus, the main contributions of the present invention, in relation to the prior art, are:

- 1- Achieve a catalytic composition with low levels of titanium and without the use of a polar solvent acting as an electron donor, making the process easier and less costly, since there is no need to add, or remove this product;
- 2- Achieve a catalytic composition with a crystalline structure different from the prior art, even if the polar solvent is removed in the process of the prior art references;

- 3- Achieve a LLDPE product with XS lower than 10% wt, which is needed to achieve better process performance without risk of "chunks" formation;
- 4- Achieve a LLDPE product with XS lower than 10% wt, which is a requirement for obtaining films without blocking and, as a consequence, superior transparency properties;
- 5- Achieve a good product performance with XS lower than 10% wt for films which have as an application the automatic packaging of grains, which represents a big volume in the Brazilian market.

Upon comparing the Ti/Mg molar ratio used in the preparation of catalysts with those which are supported in the final solid catalyst, Table 2 shows these parameters, comparing all examples from the 3 references (EP 0522651 A, EP 0480435 A and WO 91/08239) and those from the present application.

Upon analyzing the results of Table 2, it is demonstrated that the Ti/Mg molar ratio used during the preparation of the catalysts does not necessarily produce a solid catalyst with the same Ti/Mg molar ratio. It should be noted that in all cases described in the references and in the present application, there are washing steps, siphoning, and filtrations and as well as chemical processes that must occur during the synthesis.

Table 2

| | | PREPARATION OF SOLID COMPONENT CATALYST | | | FINAL SOLID COMPONENT CATALYST | | |
|---------------------|------------------------------|--|--|---|--|--|---|
| | | Amount of added Ti to the solution (mol) | Amount of added Mg to the solution (mol) | Ti/Mg molar ratio at the solution (mol/mol) | Amount of Ti at final solid component catalyst (mol) | Amount of Mg at final solid component catalyst (mol) | Ti/Mg molar ratio at final solid component catalyst (mol/mol) |
| Present Application | Example 1 | 0.969 | 0.462 | 2.1 | 0.146 | 0.082 | 1.8 |
| | Example 2 | 0.116 | 0.055 | 2.1 | 0.029 | 0.021 | 1.4 |
| | Example 3 | 0.116 | 0.055 | 2.1 | 0.025 | 0.012 | 2.1 |
| | Example 4 | 0.116 | 0.055 | 2.1 | 0.031 | 0.012 | 2.6 |
| | Example 5 | 1.163 | 0.554 | 2.1 | 0.036 | 0.099 | 0.4 |
| | Example 6 | 1.163 | 0.554 | 2.1 | 0.038 | 0.112 | 0.3 |
| | Example 7 | 0.528 | 0.252 | 2.1 | 0.044 | 0.058 | 0.8 |
| | Example 8 | 0.528 | 0.252 | 2.1 | 0.043 | 0.062 | 0.7 |
| | Example 9 | 1.163 | 0.554 | 2.1 | 0.040 | 0.119 | 0.3 |
| | Example 10 | 0.528 | 0.252 | 2.1 | 0.042 | 0.053 | 0.8 |
| EP 0522651 A | Example 1 | 0.0291 | 0.0294 | 1.0 | 0.0897 | 0.156 | 0.6 |
| | Example 2 | 0.0291 | 0.0294 | 1.0 | 0.090 | 0.161 | 0.6 |
| | Example 3 | 0.0291 | 0.0294 | 1.0 | 0.090 | 0.140 | 0.6 |
| | Example 4 (COMPARATIVO) | 0.0291 | 0.0294 | 1.0 | 0.077 | 0.156 | 0.5 |
| | Example 5 (COMPARATIVO) | 0.0291 | 0.0294 | 1.0 | 0.092 | 0.152 | 0.6 |
| | Example 6 (COMPARATIVO) | 0.0290 | 0.0294 | 1.0 | 0.088 | 0.144 | 0.6 |
| | Example 7 (COMPARATIVO) | 0.0290 | 0.0294 | 1.0 | 0.092 | 0.156 | 0.6 |
| | Example 8 (COMPARATIVO) | 0.0290 | 0.0294 | 1.0 | 0.086 | 0.148 | 0.6 |
| EP 0480435 A | Example 1 | 0.0194 | 0.0196 | 1.0 | | | 0.5 |
| | Example 2 | 0.0194 | 0.0196 | 1.0 | | | 0.7 |
| | Example 3 | 0.0194 | 0.0196 | 1.0 | | | 0.7 |
| WO 91 08239 A | Example 1 | 0.0082 | 0.0041 | 2.0 | 0.102 | 0.031 | 3.3 |
| | Example 2 | 0.0082 | 0.0041 | 2.0 | 0.092 | 0.029 | 3.2 |
| | Example 3 | 0.0082 | 0.0041 | 2.0 | 0.081 | 0.029 | 2.8 |
| | Example 4 | 0.0082 | 0.0041 | 2.0 | 0.086 | 0.040 | 2.2 |
| | Example 5 | 0.0165 | 0.0081 | 2.0 | 0.100 | 0.045 | 2.2 |
| | Example 6 | 0.0123 | 0.0061 | 2.0 | 0.094 | 0.041 | 2.3 |
| | Example 7 | 0.0082 | 0.0041 | 2.0 | 0.080 | 0.029 | 2.8 |
| | Example 8 | 0.0082 | 0.0041 | 2.0 | 0.096 | 0.041 | 2.3 |
| | Example 9 | 0.0082 | 0.0041 | 2.0 | 0.100 | 0.031 | 3.2 |
| | Example 10 | 0.0082 | 0.0041 | 2.0 | 0.073 | 0.031 | 2.4 |
| | Example 11 | 0.0082 | 0.0041 | 2.0 | 0.067 | 0.029 | 2.3 |
| | Example 12 | 0.0082 | 0.0041 | 2.0 | 0.119 | 0.070 | 1.7 |
| | Example 13 | 0.0021 | 0.0021 | 1.0 | 0.083 | 0.072 | 1.2 |
| | Example 14 (Use of vanadium) | | | | | | |

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Throughout the Examiner's Office Action, the Examiner argues that the Applicants have not shown that the composition of the reference can not produce polymers having properties as defined by the present invention. However, in the Declarations which are of record in the present application, the Applicants have compared the Examples of the present invention with those of the prior art and, in fact, have shown that the prior art does not achieve the Applicants' advantageous properties, such as for example bulk density, the presence of fines, a copolymer with a low amount of xylene solubles (XS) and the like. In this connection, the Examiner argues that comparing prior art examples with the Examples of the present invention is not persuasive since the reference is considered to be good for all that it teaches. However, it is the Applicants' position that comparing respective examples is the best type of comparison since working examples are certainly much more likely to reflect the inventive contribution of the respective references. Also, the Examiner argues that the results in the Declarations do not show that the present invention is "always superior" to the prior art. Of course, this position is clearly

erroneous since it is traditionally understood that when comparing a multiplicity of examples for the purpose of showing unexpected results, it is certainly acceptable that from time to time, one or more examples may not quite perform in the same manner as most of the examples relied upon in the Declaration.

As the Examiner acknowledges, the prior art does not disclose the amount of titanium, magnesium and chlorine which is present in the catalyst composition of the present invention (please see Table 1 on page 20 of the Applicants' previous response). The Examiner attempts to overcome this deficiency by arguing that it would be obvious to adjust the amounts of titanium, magnesium and chlorine of the prior art to fall within the Applicants' range to achieve the Applicants' results. However, the adjustments referred to by the Examiner requires a consideration of three different parameters, that is, the amount of titanium, the amount of magnesium and the amount of chlorine as well as the total amount of titanium, magnesium, and chlorine which is present in the catalyst composition of the present invention. In connection with the Luciani I reference, three of the four parameters, that is, the amount of titanium, the amount of chlorine and the total amount of titanium, magnesium and chlorine are substantially outside of the Applicants' range. In connection with Luciani II, all four parameters, that is, the amount of titanium, the amount of magnesium, the amount of chlorine and the total amount of titanium, magnesium and chlorine fall outside the Applicants' range. In the case of the Neste reference, two of the four components, that is, the amount of titanium and the amount of chlorine fall outside the Applicants' range. Thus, in an attempt to meet the limitations recited in the claims of the present application, the inventions of the respective references must be changed and the amounts of the respective components must be either increased or decreased depending on the specific situation. Since there is no reason given why one skilled in the art would change the amounts of the various components in the references, that is, either increasing the components or reducing the components, the only way that the Examiner can arrive at the Applicants' specific catalyst with the specific amounts of titanium, magnesium, chlorine, and the like, is to make adjustments to the prior art compositions in view of the Applicants' own disclosure. Working

with a plurality of component ranges certainly argues against the obviousness of making such changes to arrive at the Applicants' inventive contribution.

The present invention is directed to a process for producing a solid catalyst component used in the polymerization of olefins, for example, ethylene, as well as a solid catalyst component per se in a process for the polymerization of a polyolefin such as polyethylene, using such a solid catalyst. In the present invention, because a specific amount of titanium, a specific amount of magnesium, and a specific amount of chlorine, as well as a specific amount of all three components, are utilized and remain fixed on the solid catalyst component and because of the use of inert organic solvents "non-polar solvents," it is possible to produce particles of homo and copolymers of olefins, for example, ethylene, with a controlled morphology having a high bulk density and containing a very small quantity of fines. The catalyst system of the present invention is also effective in achieving good co-monomer insertions in the final product as well as an improved catalyst activity with low catalytic decay. All of these features of the present invention have been clearly shown in the Declarations submitted to the Examiner as well as the subject matter presented in Table 1 of the present response which can be submitted in the form of a declaration at a later date if the Examiner so chooses.

Accordingly, in view of the above remarks it is believed that all of the claims of the present application are patentably distinguishable over the prior art relied upon by the Examiner and accordingly, reconsideration of the rejections and allowance of all of the claims of the present application are respectfully requested.

Concurrent with the filing of the present Request for Reconsideration, the Applicants are also submitting herewith a Notice of Appeal in connection with the present application.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Joseph A. Kolasch Reg. No. 22,463 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

Application No. 10/518,443
Amendment dated September 8, 2008
After Final Office Action of March 7, 2008

Docket No.: 0315-0158PUS1

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.147; particularly, extension of time fees.

Dated: September 8, 2008

Respectfully submitted,

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